BY ORDER OF THE SECRETARY OF THE AIR FORCE

AIR FORCE INSTRUCTION 32-1069

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Civil Engineering

GAS SUPPLY AND DISTRIBUTION

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements AFPD 32-10, *Installations and Facilities*. It prescribes uniform requirements for utilities and services for the supply and distribution of gas (pressurized natural or bottled gas, including liquefied petroleum, but not including gasoline or related, unpressurized liquid motor fuels) to and on Air Force installations. Users should send comments and suggested improvements on AF Form 847, **Recommendation for Change of Publication**, through major commands and HQ AFCESA/ENM, 139 Barnes Drive, Tyndall AFB FL 32403-5319 to HQ USAF/CEO, 1260 Air Force Pentagon, Washington DC 20330-1260. See **Attachment 1** for a list of references, abbreviations, and acronyms used.

SUMMARY OF REVISIONS

This first issue updates references and aligns the instruction with AFPD 32-10.

1. What Base Civil Engineer (BCE) Does. BCE supplies gas for base use; constructs, operates, repairs and maintains gas generating plants, storage, transmission and distribution systems.

2. How We Supply Gas to Air Force Installations. Gas for fuel and incidental technical uses is ordinarily supplied in two ways by local public utility companies: usually under utility service contracts (refer to AFI 32-1061, *Utilities Services* [formerly AFR 91-5]); or through a direct purchase contract administered by the Defense Fuels Supply Center. In both cases, the local distribution company wheels the gas to the installation. Liquid petroleum systems are installed when economically justified or as standby for interruptible purchased gas. Liquefied petroleum gases include propane, propylene, butanes (normal butane or isobutane), and butylenes.

3. Operating and Maintaining Systems and Equipment. Use operating methods, repair procedures, and preventive maintenance practices in AFI 32-1068, *Heating Systems* (formerly AFR 91-7), AFI

32-1031, *Engineering Management* (formerly AFR 85-2), and AFM 91-6, *Maintenance and Operation of Gas Systems*. Operate the system in accordance with any required environmental and safety operating permits, including any required under Occupational Safety and Health Administration, Department of Transportation (DOT), the Natural Gas Pipeline Safety Act, CAA, etc.

4. Designing Liquefied Petroleum Gas Systems and Equipment. Follow standards of the National Fire Protection Association (NFPA) to design and install liquefied petroleum gas (LPG) systems. Take into account any environmental requirements for operating and reporting permits in system design.

4.1. Use only systems assemblies certified by Underwriters' Laboratories, Inc., or other laboratory that meets American National Standards Institute/NFPA standards, whichever are stricter. Mark the system to show design pressure. Use only those gases for which the system is designed, and at correct pressures.

4.2. Before using, be sure LPG containers meet the codes of the American Society of Mechanical Engineers and the American Petroleum Institute, and they are marked to show compliance with code requirements. Markings show designed working pressure in kilopascals (pounds per square inch) and water capacity in liters (gallons). Identify container content according to MIL-STD-101B, *Color Code for Pipelines and for Compressed Gas Cylinders*.

5. Safety. See AFM 91-6, appropriate AFOSH Standards, and the DOT *Guidance Manual for Operators of Small Gas Systems*.

5.1. Remain alert to detect and eliminate safety and fire hazards from defective gas facilities or faulty operation. Post operating instructions and precautions near gas-fired equipment.

5.2. Permit only qualified in-house or contractor personnel to install or service gas-fired equipment or gas systems. At small installations unable to justify a regular gas-equipment maintenance force, assign properly trained technicians from other specialties to maintain the gas system.

5.3. Make sure all gas on an Air Force installation has a distinct odor to allow easy detection in the atmosphere at all gas concentrations from one-fifth of the lower explosive limit and above. When such gases are not otherwise available, in-house technicians or the gas supplier will add the odorant.

5.4. BCE must also take the following safety actions:

5.4.1. Verify system critical (key) valves and other critical components have been maintained and operated as required in AFM 91-6. Documentation is essential.

5.4.2. Review leak detection survey records to ensure required surveys are thorough, analyze the potential for future failures, and show appropriate corrective actions. Analysis includes leak complaints to the fire department, security police, and civil engineering zones.

5.4.3. Verify designers of gas distribution systems know current regulations and standards. Make sure specifications include compliance with DOT Gas Pipeline Safety Provisions, including Title 49, Code of Federal Regulations (CFR), Part 192, *Transportation of Natural and Other Gas by Pipeline, Minimum Federal Safety Standards with Amendments*, current edition. Emergency planning and response requirements for gas supply and distribution systems containing hazardous materials are included in AFI 32-4002, *Hazardous Material Emergency Planning and Response Compliance* (formerly AFR 19-8).

5.4.4. Ensure that contract inspectors know gas safety requirements or a knowledgeable person is available for advice.

5.4.5. Verify gas system operators and maintainers have the required training. The Air Force has a 1-week mobile training course titled *Natural Gas Distribution System Maintenance, J4AZT 55255-001*.

6. Gas Distribution System Map. BCE prepares and maintains a general layout map of the base gas distribution system in the "G" series of the Base Comprehensive Plan. The map will be large enough to show:

- Regulator locations.
- Flow quantities and pressures.
- All connected loads.
- Size and material of all mains and services.
- Locations with respect to streets.
- Any major structures related to or served by the system.
- Valves and distribution-line regulators by number.

NOTE:

LARGE INSTALLATIONS SHOULD MAINTAIN AN AREA MAP IN ADDITION TO THE GENERAL LAYOUT MAP.

BCE must distribute a complete map to the fire chief and all base activities involved in operating and maintaining the gas distribution system. Keep copies up-to-date and show dates of revisions. Because successful system operation depends on map accuracy, BCE must do the following:

6.1. Validate maps and physically locate all isolation valves, other key valves, and regulators.

6.2. Know the purpose of each valve and the delivery point of the connected line. Complete AF Form 995, **Gate Valve/Hydrant Record**, describing system valves and regulators and showing a detailed sketch of locations. Include valves and regulators in the recurring work plan for regular maintenance.

6.3. Develop data, keyed to the maps, identifying the pipe materials in the gas system. Include the manufacturer's name, numerical designation, American Society for Testing and Materials (ASTM) number, type material and connectors, and any other descriptive information available. These data are critical for new construction or for making repairs since plastic components, including those with the same ASTM designation or manufacturer, can be incompatible and may not make a suitable joint. Title 49 CFR 192 sets requirements for joining plastic lines safely.

JAMES E. McCARTHY,, Maj General, USAF
The Civil Engineer

Attachment 1

GLOSSARY OF REFERENCES, ABBREVIATIONS, AND ACRONYMS

References

AFI 32-1031, *Engineering Management* (formerly AFR 85-2)

AFI 32-1061, *Utilities Services* (formerly AFR 91-5)

AFI 32-1068, *Heating Systems* (formerly AFR 91-7)

AFM 88-8, Chapter 5, *Nonindustrial Gas Piping Systems*

AFM 88-12, Chapter 1, *Gas Distribution*

AFM 91-6, *Maintenance and Operation of Gas Systems*

MIL-STD-101B, *Color Code for Pipelines and for Compressed Gas Cylinders*

Department of Transportation, Title 49, Code of Federal Regulations, Part 192, *Transportation of Natural and Other Gas by Pipeline, Minimum Federal Safety Standards with Amendments*, current edition. (Copies available from US Department of Transportation, Office of Pipeline Safety, 400 6th Street SW., Washington DC 20590.)

Gas Engineers Handbook (PO Box C772, Brooklyn NY 11025)

Guidance Manual for Operators of Small Gas Systems. (Copies available from US Department of Transportation Safety Institute (TSI), Pipeline Safety Division DTI-60, PO Box 25082, Oklahoma City OK 73125-5050.)

Guide for Gas Transmission and Distribution Piping Systems. (Copies available from American Gas Association, 1515 Wilson Boulevard, Arlington VA 22209.)

*NFPA No. 30, *Flammable and Combustible Liquids Code*

*NFPA No. 52, *Compressed Natural Gas (CNG) Vehicular Fuel Systems*

*NFPA No. 54, *National Fuel Gas Code*

*NFPA No. 55, *Standard for the Storage, Use and Handling of Compressed and Liquefied Gases in Portable Cylinders*

*NFPA No. 58, *Storage and Handling of Liquefied Petroleum Gases*

*Copies available from the National Fire Protection Association, 1 Batterymarch Park, Quincy MA 02269-9990.

Abbreviations and Acronyms

ASTM—American Society for Testing and Materials

BCE—Base Civil Engineer

CFR—Code of Federal Regulations

DOT—Department of Transportation

LPG—Liquified Petroleum Gas

NFPA—National Fire Protection Agency